

acuta, 5-nervia, glabra; palea flosculi primi 1.5 mm longa, hyalina; caryopsis libera; fructus 1.5 mm longus, acutus, lucidus.

Perennial; culms 80 cm long, prostrate spreading, ascending at the ends, branching, rooting at the lower nodes; sheaths shorter than the internodes or the upper ones a little longer than the internodes, glabrous, pubescent at the mouth; blades short pedicellate, 4.5–6.5 cm long, 1–1.5 cm wide, ovate-lanceolate, acuminate, with white cartilaginous margins; panicles 16–17 cm long with 15 rather remote ascending racemes 1–2.5 cm long; spikelets rather densely arranged on one side of the rachis, 2-flowered, paired, 2–2.2 mm long, spreading, the first sessile, the second pedicellate; first glume 0.7–1 mm long, 1-nerved, acute; second glume and lemma of the first floret similar, subequal, acute, 5-nerved; palea of first floret 1.5 mm long, hyaline; caryopsis free; fruit 1.5 mm long, acute, smooth and shining.

Type in the U. S. National Herbarium, no. 1644874, collected on stony river bank in the vicinity of El General, Province of San Jose, Costa Rica, altitude 760 meters, February 1939, by Alexander F. Skutch (no. 4115).

Panicum irregulare is related to *P. frondescens* Meyer, which has a denser, shorter panicle of more numerous racemes and larger spikelets 2.6–2.8 mm long with the lower floret sterile.

BOTANY.—*Arizona plants: New species, varieties, and combinations.*¹

F. J. HERMANN, T. H. KEARNEY, and R. H. PEEBLES, U. S. Bureau of Plant Industry.

A paper on this subject appeared in this JOURNAL on November 15, 1939 (29: 474–492). A few additional novelties have since come to light, and they are published here in order to avoid publication of new names in a flora of Arizona, now in preparation.

Juncus interior Wieg. var. *arizonicus* (Wieg.) Hermann, comb. nov.

Juncus arizonicus Wieg., Bull. Torrey Bot. Club 27: 517. 1900.

Juncus interior Wieg. var. *neomexicanus* (Wieg.) Hermann, comb. nov.

Juncus neomexicanus Wieg., Bull. Torrey Bot. Club 30: 447. 1903.

Both *J. arizonicus* and *J. neomexicanus* possess the acuminate to aristate bracteoles of *J. interior*, which set this species off from its nearest allies. Intermediates are frequent between the two varieties here proposed and typical *J. interior*, but most material falls rather readily into one of the three forms and may be distinguished by the following key:

Perianth equaling the capsule, 3–4 mm long. *J. interior*
 Perianth exceeding the capsule, 4–5 mm long.

Bracteoles lanceolate, acuminate; perianth-segments erect, rigid, lanceolate, their hyaline margins relatively narrow and opaque. . . .

. *J. interior* var. *arizonicus*

Bracteoles broadly ovate, acute to abruptly aristate; perianth-segments spreading, not rigid, broadly ovate, with broad transparent scarious margins and brown lateral bands bordering the green center. . . .

. *J. interior* var. *neomexicanus*

¹ Received February 1, 1940.

Juncus longistylis Torr. var. **scabratus** Hermann, var. nov.

A varietate typica recedit foliis pedicellisque scabratis.

Of the 20 collections of *J. longistylis* seen from Arizona, 9 represent the typical form of the species and, except for one specimen from the Huachuca Mountains (Cochise County), all are from the northern half of the State. The others have the vegetative parts scabrate much as in the eastern *J. caesariensis* Coville, and the auricles show a tendency to be prolonged, free, and acute. The scabrosity is most conspicuous upon the pedicels and the terminal portions and margins of the leaves. Intergradations with the typical form are found in various degrees, however. The following collections in the U. S. National Herbarium are characteristic of var. *scabratus*: Near Prescott, alt. 5,350 feet, Yavapai County, *Peebles, Harrison, & Kearney* 2712, August 8, 1926 (TYPE); Willow Springs, Apache, County *E. Palmer* 556 (in part) and 624 (in part), July 1890.

Juncus tracyi Rydb. f. **utahensis** (Martin) Hermann, comb. nov.

J. utahensis Martin, *Rhodora* 40: 69-71. 1938.

Juncus tracyi manifests two forms, a few-headed, many-flowered phase, characterized by the type specimen of Rydberg's species, and a many-headed, few-flowered phase, represented by the type specimen of *J. utahensis*. The extremes of these forms are strikingly different in appearance yet intermediates are plentiful and there is no apparent geographic segregation of the extremes. *Juncus ensifolius* Wikstr., *J. phaeocephalus* Engelm., *J. saximontanus* A. Nels., *J. canadensis* J. Gay, and *J. acuminatus* Michx. are other species that exhibit a parallel series of forms.

Juncus saximontanus A. Nels. f. **brunnescens** (Rydb.) Hermann, comb. nov.

Juncus brunnescens Rydb., *Bull. Torrey Bot. Club* 31: 400. 1904.

This form shows the same instability as does *J. tracyi* f. *utahensis* and like it seems to have no geographic significance. The extremes may be distinguished by the following key:

- Inflorescence composed of few (seldom more than 10) heads, which average 7-10 mm in diameter and are many (15 to 25)-flowered.....
*J. saximontanus*
 Inflorescence composed of numerous (usually more than 10) heads, which average 5-6 mm in diameter and are few (5 to 12)-flowered.....
*J. saximontanus* f. *brunnescens*

Astragalus cobrensis Gray var. **maguirei** Kearney, var. nov.

Ab *A. cobrensis* f. typica pilis longioribus patentibus, foliolis supra parce pubescentibus, calycis dentibus quam tubo longioribus, recedit.

Type from White Tail Canyon, Chiricahua Mountains, Cochise County, Ariz., in sandy soil under oak and walnut, *Bassett Maguire et al.* 11079, May 2, 1935 (U. S. National Herbarium no. 1768940).

The variety here described has rather long spreading hairs on the herbage and pods, leaflets sparsely pubescent above, and calyx with teeth longer than the tube, whereas in typical *A. cobrensis* the hairs are shorter and appressed, the leaflets glabrous above, and the calyx-teeth about as long as the tube. The flowering stems in var. *maguirei* (probably also in *A. cobrensis*) arise from long, slender, creeping rootstocks.

Astragalus cobrensis, known only from southwestern New Mexico, is sparingly represented in herbaria, and var. *maguirei* is known only by the type collection. Study of additional material of these forms may prove *maguirei* to be a distinct species.

***Echinocereus robustus* Peebles, sp. nov.**

Echinocereus rectispinus Peebles var. *robustus* Peebles, Amer. Journ. Bot. 25: 675. 1938.

ZOOLOGY.—*The hairworm, Gordius robustus Leidy, as a parasite of the Mormon cricket, Anabrus simplex Haldeman.*¹ GERALD THORNE, U. S. Bureau of Plant Industry.

INTRODUCTION

Parasites effective against the Mormon cricket, *Anabrus simplex* Haldeman, apparently are very rare. It was, therefore, of considerable interest when there were reports of a heavy parasitism by *Gordius robustus* Leidy in the vicinity of Arrowrock Dam, Idaho (1). Visits to that locality were made by the writer on July 26 and October 9, 1935, and on May 16 and August 24, 1936. The unusual populations occurring there presented excellent opportunities for studying the parasite from the standpoint of life history, habits, host relationship, ecology, and economic importance. Specimens for more detailed examination and experiments were taken to the Salt Lake City, Utah, laboratory.

This observation of *Gordius robustus* coincided with the unprecedented populations of *Anabrus simplex* which first appeared at Fort Hall, Idaho, in May, 1932, and by August, 1936, had infested almost 2,000,000 acres in 24 counties of Idaho (11). Similar outbreaks of the cricket occurred in other western States (Fig. 1).

HISTORICAL

Gordius robustus Leidy, 1851, belongs to the rather common group of organisms known as "hairworms," the adults of which are usually found inhabiting warm shallow pools or streams. In its immature stages it is known as a parasite of certain insects, principally Orthoptera.

The first record of *Gordius robustus* in *Anabrus simplex* (synonym *A. pur-*

¹ The writer is indebted to Claude Wakeland and R. W. Haegele, who gave valued preliminary information on the distribution of *Gordius robustus* in the Arrowrock section and joined in visiting the area on two occasions. J. Percy Moore, of the University of Pennsylvania, kindly lent the Leidy collection of *G. robustus* from Milk River, Mont., and Dr. Henry B. Ward forwarded the May collection from Urbana, Ill., for comparison with the Idaho and western Montana specimens collected in 1935. G. Steiner and Edna M. Buhner have given valuable suggestions on the manuscript and bibliography. The map used in Fig. 1, giving the 1937 distribution of *Anabrus simplex*, is taken from a U. S. Department of Agriculture Press Service release, March 26, 1937. Received November 18, 1939.